

## **Design 3D models like stepped shaft model and flange coupling model in SolidWorks**

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# Prerequisite/Recapitulations

1. Knowledge of Basic Commands used in SolidWorks
2. Coordinate Geometry



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## EDITING SKETCHED ENTITIES

### Trimming Sketched Entities

**Command Manager:** Sketch > Trim

Entities flyout> Trim Entities

**SOLIDWORKS menus:** Tools > Sketch

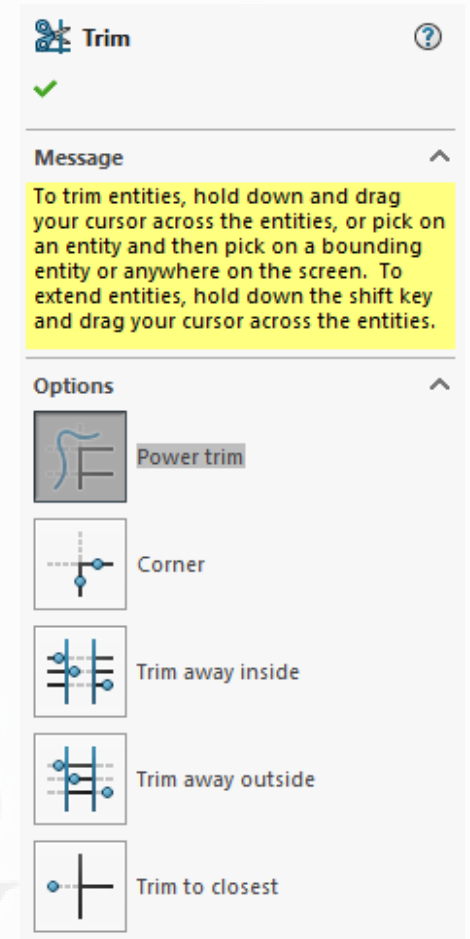
Tools > Trim

**Toolbar:** Sketch > Trim Entities

flyout> Trim Entities

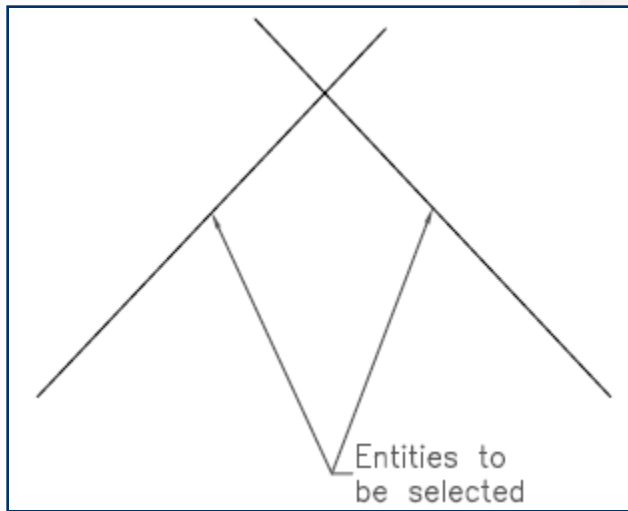
- **Message Rollout**

- **Options Rollout**

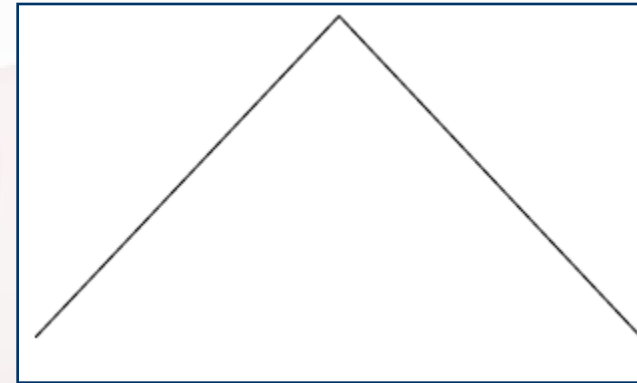


Power trim

Corner

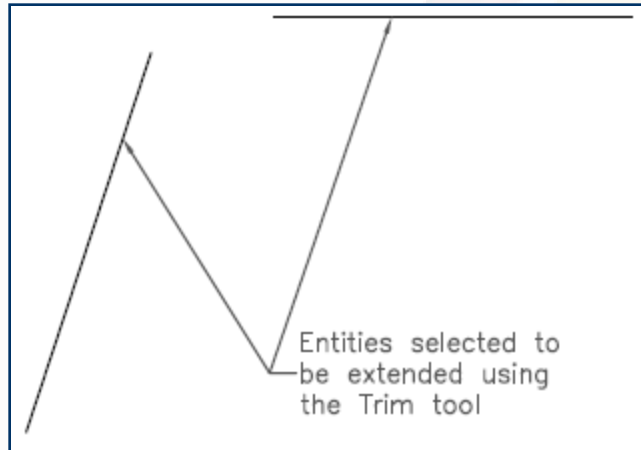


**Figure 2** Entities to be selected for trimming

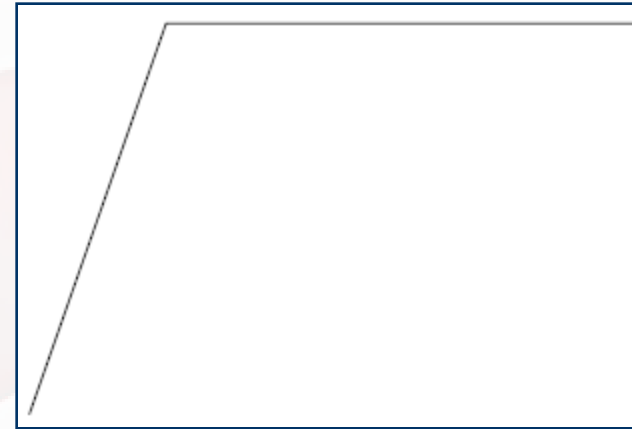


**Figure 3** Entities after trimming

## Extend



**Figure 4** Entities selected to extend



**Figure 5** Sketch after extension

## Filleting Sketched Entities

**CommandManager:**

Sketch Fillet

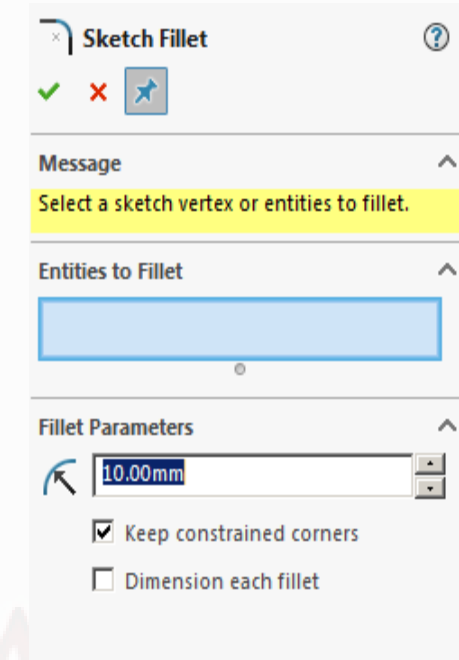
**SOLIDWORKS menus:**

**Toolbar:**

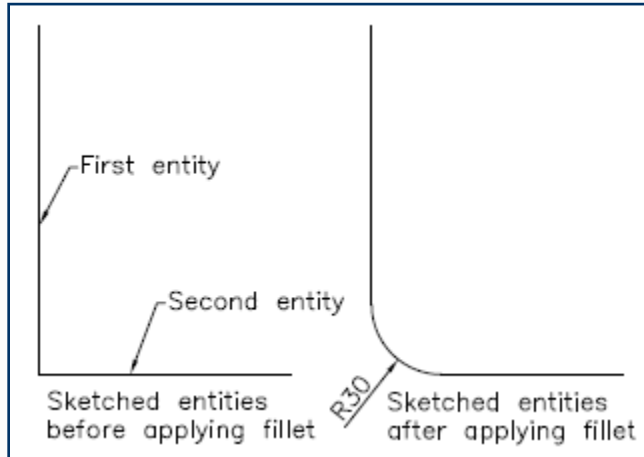
Sketch > Sketch Fillet flyout>

Tools > Sketch Tools > Fillet

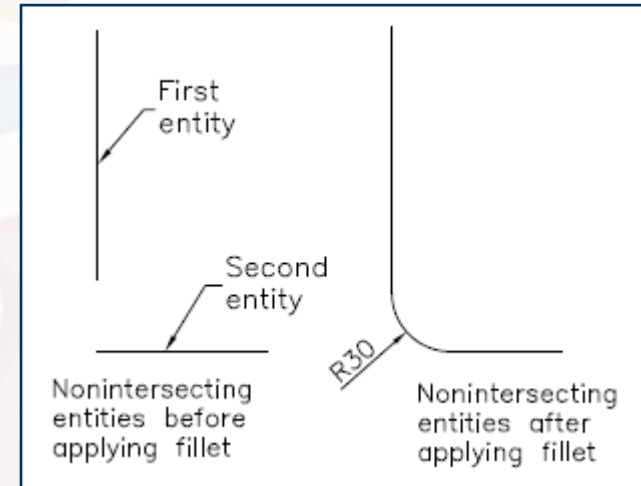
Sketch > Sketch Fillet flyout> Sketch Fillet



**Figure 6 The Sketch Fillet  
PropertyManager**



**Figure 7** Intersecting entities before and after applying a fillet



**Figure 8** Non-intersecting entities before and after applying a fillet

## Chamfering Sketched Entities

**CommandManager:**

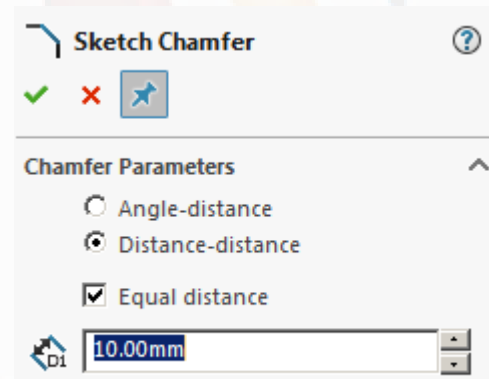
Sketch > Sketch Fillet flyout > Sketch Chamfer

**SOLIDWORKS menus:**

Tools > Sketch Tools > Chamfer

**Toolbar:**

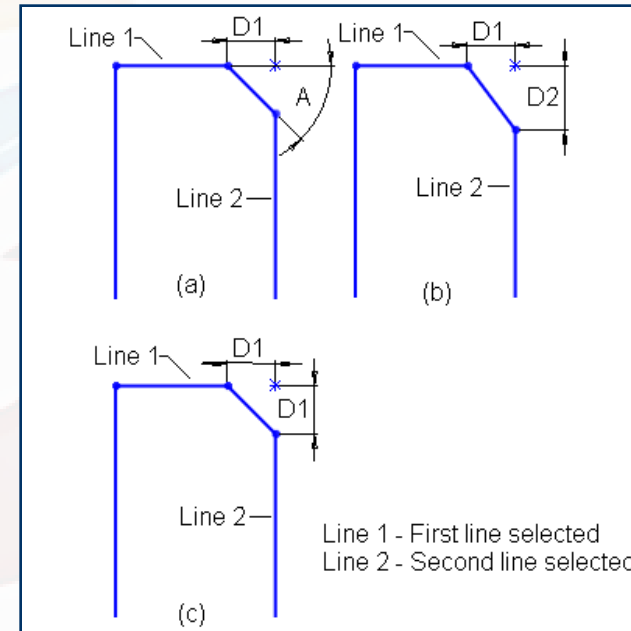
Sketch > Sketch Fillet flyout > Sketch Chamfer



**Figure 9** The **Sketch Chamfer PropertyManager**



- Angle-distance
- Distance-distance
- Equal distance

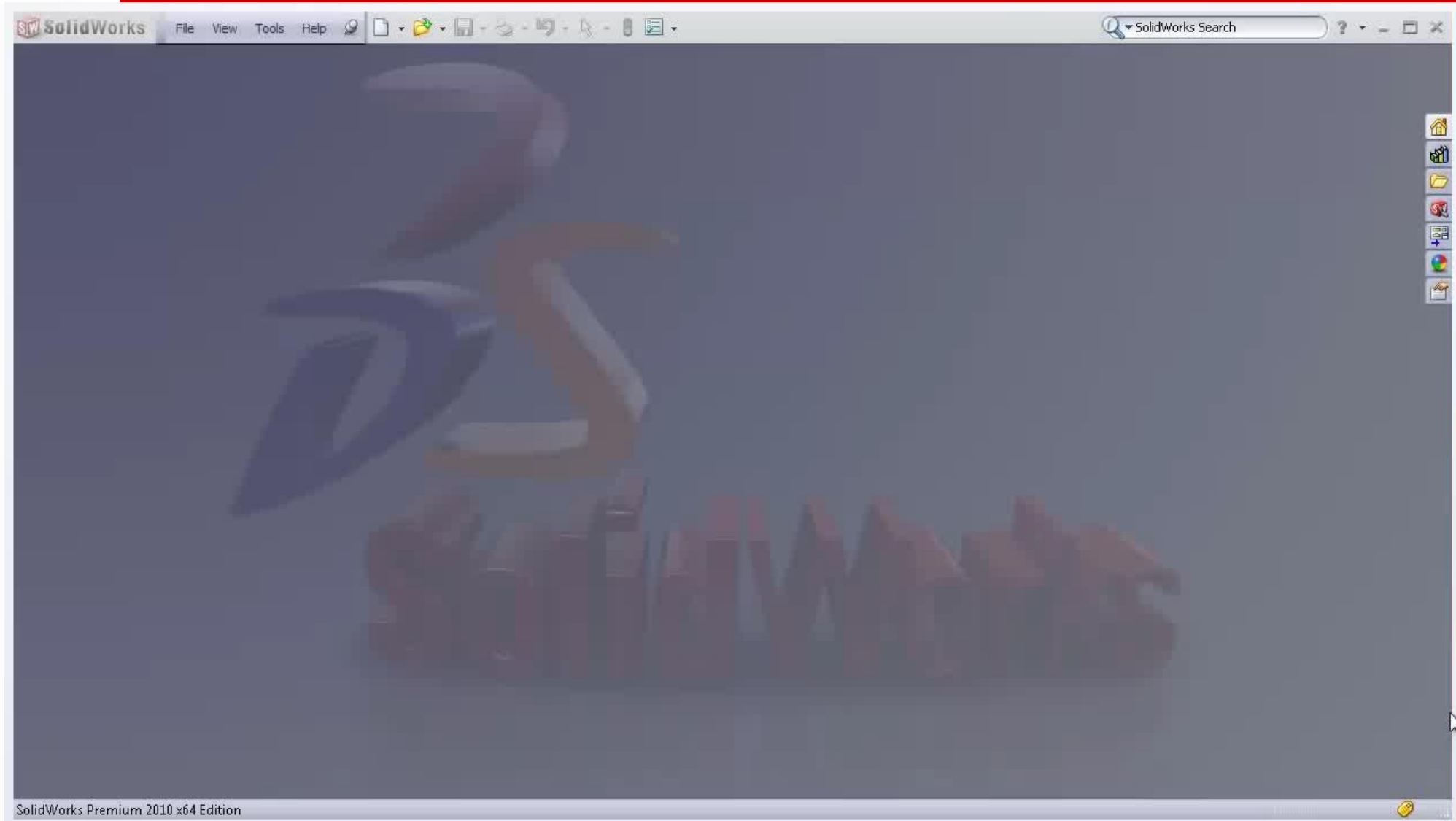


**Figure 10** Chamfers and their parameters

# Solid Modeling of Stepped Shaft

Stepped shafts are widely applied in machine and automotive industry , they are used to transmit power from input source to the other parts of a transmission system

# Animation Video



# Objectives

**To Learn the solid modeling of stepped shaft and flange coupling used in industries**



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# Solid Modeling of Stepped Shaft



All dimensions are inches

Write the procedure to create a solid model of the stepped shaft.

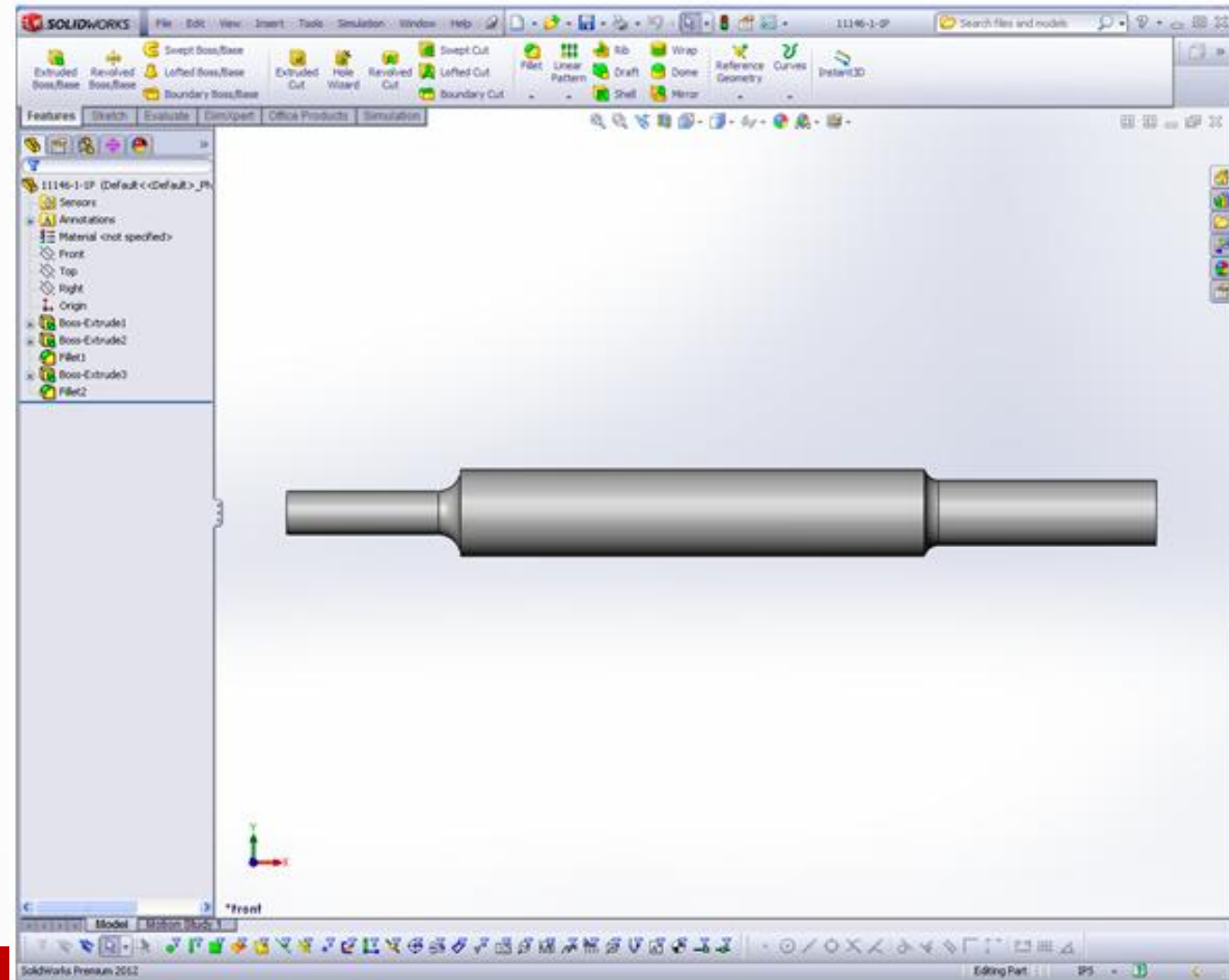
1. Draw a circle of diameter 1.5 inch by clicking on sketch command after selecting the required plane.
2. Extrude the circle by 8 inch length by use of base extrude command.
3. Draw a circle of diameter 0.75 inch by selecting one end face of the cylinder.
4. Extrude the circle by 3 inch length by use of base extrude command.

5. Create a fillet of radius 0.38 inch by clicking on fillet command from tool bar and then clicking on the required edge and then type 0.38 inch.
6. Draw another circle of diameter 1.125 inch by selecting other end face of the cylinder.
7. Extrude the circle by 4 inch length by use of base extrude command
8. Create a fillet of radius 0.25 inch by clicking on fillet command from tool bar and then clicking on the required edge and then type 0.25 inch.

# Solid Model stepped shaft

## Step 2 of 2

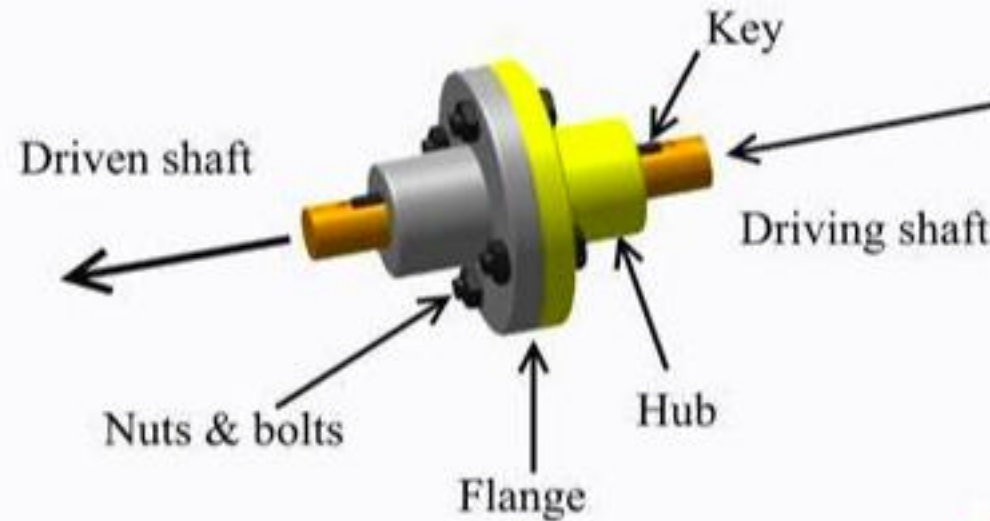
Draw the sketch of the stepped shaft which is obtained by the above procedure.



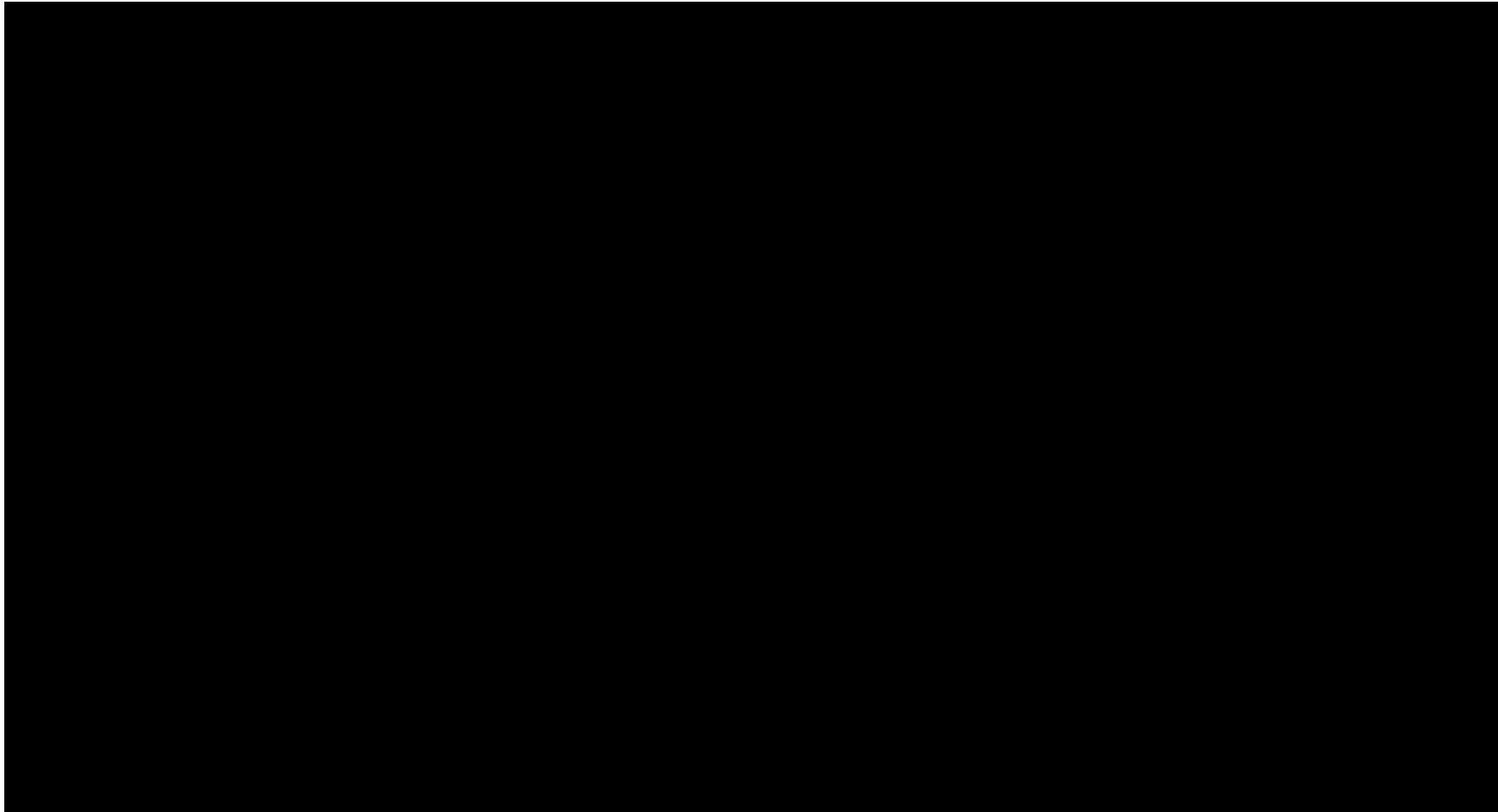
# Flange Coupling

A flange coupling usually applies to a coupling having two separate cast iron flanges. Each flange is mounted on the shaft end and keyed to it. The faces are turned up at right angle to the axis of the shaft. One of the flange has a projected portion and the other flange has a corresponding recess.

## FLANGE COUPLING







- 1) Solid Modeling of Connecting rod
- 2) Solid Modeling of Piston



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- **Engineering Drawing by N. D. Bhatt and V. M. Panchal**
- **Engineering Graphics by K. C. John**
- **NPTEL**



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Thank You

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